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ORGINAL ARTICLE

A Cross-Sectional And Observational Study To Assess The Health Status Of People Engaged In The Tailoring Occupation In An Urban Slum Of Mumbai, India

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Introduction

Occupational health is a term which became fashionable after the war; its proponents claim that it includes much more than medicine [1]. Until recently, the concept of occupational diseases denoted a specific clinical and pathological syndrome which was caused by a hazard which was specific to a particular type of work or the work environment. Today, this concept is changed. We know that the occurrence of occupational diseases may be affected by non-occupational factors such as nutritional status and on the other hand, the prevalence and incidence of several common diseases may also be influenced by occupation [2].

With modern technology, many hazardous exposures at work have been reduced .The workload and the intensity of activity are the ergonomic factors that largely determine the effects of the work environment on health. Harmful effects at work may not necessarily occur simultaneously, but may be consecutive or intermittent. Evaluation of the adverse health effects of long term exposure to low level harmful factors at work is currently the most pressing problem in occupational health. The adverse effects are defined by a WHO [3].

In the post independence period, India has made great strides in industrialization. The industrial scene presents a conglomerisation of all sorts of industries, the so called 'Large scale industries' on one hand and the cottage industries on the other, with a variety of small scale industries intervening. This unprecedented expansion has produced a complex phenomenon involving industrial accidents, health hazards and occupational diseases.

While the health hazards prevalent in the big industry has drawn the attention of the experts because of the dramatic element involved, this aspect does not assume any importance in relation to the industries which do not involve the machine factor at all. The tailoring occupation is of this nature. The health hazards involved in it are totally of a different pattern in comparison to the hazards involved in other industries where heavy machines are moved or dangerous chemicals are handled.

Such hazards are likely to go unnoticed. This in itself underlines the need to approach such an occupation with a conscious effort to see that these hazards are brought into focus.

Little has been published about the known or suspected health risk of workers employed in the tailoring occupation, despite the fact that this occupation is a way of livelihood for many people in underdeveloped or undeveloped areas.

It is rather disappointing that the tailoring occupation which employs great human

potential and having a certain future, has not been given appropriate attention by research scholars in particular, to study the working conditions and the health hazards.

So. a study was carried out with the aim to identify the health status in people engaged in the tailoring occupation in an urban slum in the city of Mumbai.

Need and Rationale

"Occupational environment" means the sum of the external conditions and the influences which prevail at the place of work and which have a bearing on the health of the working population. The industrial workers today are placed in a highly complicated environment which is getting more complicated as man is ingenious. There are three types of interactions in a working environment [4]
a) Man and physical, chemical, and biological agents.
b) Man and machine
c) Man and man.

The factors that influence the health of the population also apply equally to industrial workers, e.g. housing, water, sewage, waste disposal, nutrition and education. In addition to these factors, the health of industrial workers in a large measure will also be influenced by conditions prevailing at their work place.

One such attempt has been made here, wherein the effect of the tailoring occupation on the health status of people engaged in tailoring work, residing in an urban slum has been studied.

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors which are adverse to health; the placing and the maintenance of the workers in an occupational environment which is adapted to their physiological and psychological health [5].

Aim

To promote health, prevent occupation associated health diseases,to establish services for availing health problems and the rehabilitation of affected people who are employed in the tailoring occupation in an urban slum of Mumbai

Objectives

1. To assess the socio-economic and the demographic profile of the people who are engaged in the tailoring occupation.
2. To assess the health status of the people in the tailoring occupation.
3. To assess the impact of various socio-demographical and work related factors on the health status of people employed in the tailoring occupation.
4. To put forth recommendations if necessary, regarding preventive measures at different levels that can be taken to improve the health status of people in the tailoring occupation.

Materials And Methods

It was a cross-sectional study. All tailors residing in the urban slum area of Cheetah Camp formed the study population. The selection of tailors was done by defined criteria. The beneficiaries meeting the following inclusion criteria were selected. All those tailors who were specialized in ladies and gents tailoring and bag making, those who were self employed and those working as employees in shops, those working in-house and in a shop set-up, those working as full time and part time workers, those engaged in the tailoring occupation for at least last 1 year and the beneficiaries fulfilling the above mentioned inclusion criteria were included in the study.

A semi-structured interview examination schedule and an observational check-list were prepared, field tested and modified as necessary for use in this study.

Sample Size Calculation

The sample size was calculated using the following formula:

Sample size = n / (1-n / population) [6]
Where n = Z * Z [P(1-P) / D*D] [6]
However, as the tailoring occupation comes under the unorganized sector the tailors in the study area were not registered under the ESIS Act. So, it was not possible to get the actual total figure of tailors. So, with the help of CDO, CHV and the NGOs (CDO-community Development officer,CHV-community health volunteer, NGO-non governmental organisation) working in the slum areas, an approximate figure of 3,500 tailors (either self employed or working as employees in a shop or in bag making factories) was estimated and a sample size of 100 was calculated.

A survey was carried out with the help of CDO and CHW (CHW-community health worker) of an urban health center to identify the no. of tailors, their distribution, the average no. of workers in a sector, etc.

Sampling Design

The sample size was derived from the formula for calculating the sample size in a community based study, as was depicted by the Epi-info 2000 software package which was designed by CDC and was approved by WHO.

But, in this study, as people engaged in the tailoring work consisted of study objects which come under unorganized industries, their total number in the community is not known .Hence, a total of 100 samples were collected by taking 3500 as the estimated population of tailors and on the basis of inclusion criteria.

The urban slum community is a resettlement colony on the outskirts of Mumbai since 1977.The population of Cheetah camp is approximately 87,000 [Census 2005].

The data was analyzed by the SPSS software and was presented in the form of percentages, mean and standard deviation and the Chi-square test was applied wherever necessary.

Results And Discussions

The data obtained was analyzed and the results are given below:

[Table/Fig 1] (A)

(Table/Fig 1) Religion compared between Male and Female Subjects

Religion		Gender		Total
		Female	Male	
Hindu	No.	1	22	23
	%	6.30%	26.20%	23.00%
Muslim	No.	15	59	74
	%	93.80%	70.20%	74.00%
Christian	No.	0	3	3
	%	0.00%	3.60%	3.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	3.899	2	0.142	Not significant

[Table/Fig 1] (B)

(Table/Fig 1) (B) Educational Status compared between Male & Female Subjects

Educational Status		Gender		Total
		Female	Male	
Illiterate	No.	2	20	22
	%	12.50%	23.80%	22.00%
Primary	No.	4	25	29
	%	25.00%	29.80%	29.00%
Secondary	No.	10	38	48
	%	62.50%	45.20%	48.00%
Higher Secondary	No.	0	1	1
	%	0.00%	1.20%	1.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	1.911	3	0.591	Not significant

[Table/Fig 2] (A)

(Table/Fig 2) (A) Socioeconomic Class compared between Male & Female Subjects

Socioeconomic Class		Gender		Total
		Female	Male	
1	No.	2	24	26
	%	12.50%	28.60%	26.00%
2	No.	7	49	56
	%	43.80%	58.30%	56.00%
3	No.	3	7	10
	%	18.80%	8.30%	10.00%
4	No.	1	3	4
	%	6.30%	3.60%	4.00%
5	No.	3	1	4
	%	18.80%	1.20%	4.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	13.905	4	<0.05	Significant

As was discussed in Table/Fig 2 (A) [Table/Fig 2] (A), the probability that the local women may have joined tailoring to earn a livelihood was supported when the socioeconomical class of the subjects was compared with their gender.

Thus, while males have a higher risk of disease because of their distance from the family, poor housing conditions and long work hours, females are already underprivileged due to their poor socioeconomical status. These multiple complexities need to be resolved by multipronged and multi-layer interventions.
[Table/Fig 2] (B)

(Table/Fig 2) (B) Independent/Employed compared between Male & Female Subjects

Independent/Employed		Gender		Total
		Female	Male	
Independent	No.	13	10	23
	%	81.30%	11.90%	23.00%
Employed	No.	3	74	77
	%	18.80%	88.10%	77.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	36.493	1	<0.05	Significant

[Table/Fig 3](A)

(Table/Fig 3) (A) Specialty in Tailoring compared between Male & Female Subjects

Specialty in Tailoring		Gender		Total
		Female	Male	
Ladies specialist	No.	16	29	45
	%	100.00%	34.50%	45.00%
Bag making specialist	No.	0	33	33
	%	0.00%	39.30%	33.00%
Gents specialist	No.	0	22	22
	%	0.00%	26.20%	22.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	23.280	2	<0.05	Significant

[Table/Fig 3] (B)

(Table/Fig 3) (B) Clinical Examination findings compared between Male & Female Subjects

Clinical Examination findings		Gender		Total
		Female	Male	
Pallor	No.	15	10	25
	%	93.80%	11.90%	25.00%
Clubbing	No.	0	10	10
	%	0.00%	11.90%	10.00%
Clubbing+Pallor	No.	0	1	1
	%	0.00%	1.20%	1.00%
LN enlargement	No.	0	5	5
	%	0.00%	6.00%	5.00%
Edema feet	No.	1	6	7
Paronychia	No.	0	1	1
	%	0.00%	1.20%	1.00%
Icterus	No.	0	1	1
	%	0.00%	1.20%	1.00%
Dry tounge	No.	0	1	1
	%	0.00%	1.20%	1.00%
NAD	No.	0	49	49
	%	0.00%	58.30%	49.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	48.980	8	<0.05	Significant

[Table/Fig 4] (A)

(Table/Fig 4) (A) Decrease in Visual acuity compared between Male & Female Subjects

Visual acuity decreased for-		Gender		Total
		Female	Male	
Near vision	No.	5	20	25
	%	31.30%	23.80%	25.00%
Distant vision	No.	7	24	31
	%	43.80%	28.60%	31.00%
Near + Distant	No.	2	2	4
	%	12.50%	2.40%	4.00%
NAD	No.	2	38	40
	%	12.50%	45.20%	40.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	8.338	3	<0.05	Significant

This could be because most females work at their houses, which are shanties with no natural light or additional lightening for tailoring, while males were given an ambient workplace to work in. Besides, the female tailors were on an average more aged than the male tailors [Table/Fig 4] (B).

(Table/Fig 4) (B)Musculoskeletal Complaints compared between Male & Female Subjects

Musculoskeletal Complaints		Gender		Total
		Female	Male	
Yes	No.	15	83	98
	%	93.80%	98.80%	98.00%
No	No.	1	1	2
	%	6.30%	1.20%	2.00%
Total	No.	16	84	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	1.755	1	0.185	Not significant

[Table/Fig 5] (A)

(Table/Fig 5) (A) Personal History-Addiction compared by Working Experience of the Subjects

Personal History-Addiction		Working Experience				Total
		<10	10 to 20	20 to 30	30 to 40	
Yes	No.	15	28	16	4	63
	%	45.50%	66.70%	80.00%	80.00%	63.00%
No	No.	18	14	4	1	37
	%	54.50%	33.30%	20.00%	20.00%	37.00%
Total	No.	33	42	20	5	100
	%	100%	100%	100%	100%	100%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	7.700	3	0.053	Not significant

[Table/Fig 5] (B)

(Table/Fig 5) (B) Injury-finger/arms/feet/callosity of finger compared by Working Experience of the Subjects

Injury-finger/arms /feet/callosity of finger		Working Experience				Total
		<10	10 to 20	20 to 30	30 to 40	
Callosity of Fingers	No.	20	37	20	5	82
	%	60.60%	88.10%	100%	100%	82.00%
Injury to Fingers	No.	5	2	0	0	7
	%	15.20%	4.80%	0.00%	0.00%	7.00%
Nail deformity	No.	1	2	0	0	3
	%	3.00%	4.80%	0.00%	0.00%	3.00%
NAD	No.	7	1	0	0	8
	%	21.20%	2.40%	0.00%	0.00%	8.00%
Total	No.	33	42	20	5	100
	%	100%	100%	100%	100%	100%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	20.246	9	0.016	Significant

Tailoring involves monotonous, highly repetitive tasks which are performed in a sitting working posture and needing due concentration and this repetitiveness exposes the same area of the fingers and the hand. Hence, tailoring is associated with a high incidence of callosities. This fact was found in the present study, as well with all tailors showing callosity beyond 20 years of tailoring work. In addition, since the stitching needs the cloth to be pressured manually close to the stitching needle and needs to be guided properly, there is a higher chance of finger injury. However, finger injury was seen only in those who had been in the tailoring job for less than 20 years and those with higher experience were trained to avoid these accidents.
[Table/Fig 6] (A)

(Table/Fig 6) (A) Musculoskeletal Complaints compared by Working Experience of the Subjects

Musculo-skeletal Complaints		Working Experience				Total
		<10	10 to 20	20 to 30	30 to 40	
Yes	No.	32	41	20	5	98
	%	97.00%	97.60%	100.00%	100.00%	98.00%
No	No.	1	1	0	0	2
	%	3.00%	2.40%	0.00%	0.00%	2.00%
Total	No.	33	42	20	5	100
	%	100%	100%	100%	100%	100%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	0.720	3	0.868	Not significant

The monotonous, repetitive work performed in a sitting working posture and needing concentration, obviously puts continuous strain and stress on selected muscles and bones of the tailors and the very limited break and changes from the tailoring task takes its toll in the form of musculoskeletal problems. Corrective measures are a must for this rampant problem among the tailors.
[Table/Fig 6] (B)

(Table/Fig 6) (B) Comparison of Educational Status with Tailoring

Educational Status		Specialty in Tailoring			Total
		Ladies	Bag making	Gents	
Illiterate	No.	8	6	8	22
	%	36.40%	27.30%	36.40%	100.00%
Primary	No.	19	4	6	29
	%	65.50%	13.80%	20.70%	100.00%
Secondary & HS	No.	18	23	8	49
	%	36.70%	46.90%	16.30%	100.00%
Total	No.	45	33	22	100
	%	45.00%	33.00%	22.00%	100.00%

Chi-square Test	Value	DF	P-value	Association is-
Pearson Chi-Square	12.970	4	0.011	Significant

This finding indicates that educated tailors are preferred for the bag making work as it needs a higher level of formal training and skill.
[Table/Fig 7](A)

(Table/Fig 7) (A)Clinical Examination findings compared with Type of job (Full time/Part time)

Clinical Examination findings		Type of job FT/PT		Total
		Full Time	Part Time	
Pallor	No.	15	10	25
	%	17.00%	83.30%	25.00%
Clubbing	No.	10	0	10
	%	11.40%	0.00%	10.00%
Clubbing+Pallor	No.	1	0	1
	%	1.10%	0.00%	1.00%
LN enlargement	No.	5	0	5
	%	5.70%	0.00%	5.00%
Edema feet	No.	6	1	7
	%	6.80%	8.30%	7.00%
Paronychia	No.	1	0	1
	%	1.10%	0.00%	1.00%
Icterus	No.	1	0	1
	%	1.10%	0.00%	1.00%
Dry tounge	No.	1	0	1
	%	1.10%	0.00%	1.00%
NAD	No.	48	1	49
	%	54.50%	8.30%	49.00%
Total	No.	88	12	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	25.788	8	0.001	Significant

The clinical findings were more relevant to the poor socioeconomical and nutritional status of the tailors and to the repeated use of their fingers.
[Table/Fig 7] (B)

(Table/Fig 7) (B) Decrease in Visual acuity compared by Working Experience of the Subjects

Visual acuity decreased for-		Type of job FT/PT		Total
		Full Time	Part Time	
Near vision	No.	19	6	25
	%	21.60%	50.00%	25.00%
Distant vision	No.	28	3	31
	%	31.80%	25.00%	31.00%
Near + Distant	No.	2	2	4
	%	2.30%	16.70%	4.00%
NAD	No.	39	1	40
	%	44.30%	8.30%	40.00%
Total	No.	88	12	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	12.456	3	0.006	Significant

[Table/Fig 8]

(Table/Fig 8) Preventive Measures in last 6 months (TT &/or Ungustan) compared with Type of job (Full time/Part time)

Preventive Measures in last 6 months (TT &/or Ungustan)		Type of job FT/PT		Total
		Full Time	Part Time	
Yes	No.	19	6	25
	%	21.60%	50.00%	25.00%
No	No.	69	6	75
	%	78.40%	50.00%	75.00%
Total	No.	88	12	100
	%	100.00%	100.00%	100.00%

Chi-square Test applied	Value	DF	P-value	Association is-
Pearson Chi-Square	4.545	1	0.033	Significant

This is so because as seen in previous sections, most part-time tailors are females who have undergone formal tailoring courses more than the male tailors and hence, are aware of preventive devices like Ungustan. On the other hand, male tailors were more seasoned in the tailoring profession and hence, may not have felt the need to use protective devices or it could be sheer negligence on their part.

Discussion

Prospectus Of The Tailoring Job

Better education leads to better prospectus for earning a livelihood and also better grades and skills in whatever job is opted for. Tailoring is no exception to this.

The reason for this observation may be the lack of educational opportunities, early initiative of taking up the tailoring job, migration or monitory constraints. Reciprocally, poor educational levels may push the subjects to do any job that is easily available, tailoring being one such job. Most of the workers are the migrant population who come from states with poor educational progress and hence, the observation of lack of education in the study.

Besides, none of the workers go to part time schools as the nature of work for most subjects is such that after working 8-10 hrs per day, they would naturally want to take rest to get set for the next day's work.

Importance Of Education

The educational scenario if changed through the adult learning course in the locality or through task/tailoring oriented workshop/courses, will not only improve the calibre of the subjects, but will also increase their earning power and their

standard of living in an expensive city like Mumbai.

Female Workforce In The Tailoring Job

Reasons apart, the female counterparts in the tailoring occupation most often do part time jobs and are hence, work from their residence, independently managing their work timings. This could save them from stress, strain and the health hazards associated with the tailoring jobs, while males have to work most of the time round the clock in congested crowded industrial rooms. This reconfirms the need to put interventions which will also cover the male tailors in addition to activities oriented towards females whose health is already compromised in our society.

Obvious findings show that the female tailors who work part time and are self employed do only the stitching of female dresses and do not have exposure to other aspects of the tailoring profession like stitching of male suits, trousers, shirts or even making bags . This fact limits their spare of work area and puts them in a disadvantaged situation, as they cannot expand their occupation to involve other evolving new fashion trends or specialized work like bag making. An initiative has to be taken to break this barrier.

Prevalence Of Pallor

The reason for the high prevalence of pallor in female tailors may be nutritional deficiency, which is highly prevalent among rhe women in our country and iron deficiency anaemia is a major nutritional problem in India. The incidence of anaemia is highest among women and young children, varying between 60-70 %. Iron deficiency can arise due to inadequate intake or poor bioavailability of dietary iron or due to excessive losses of iron from the body.

As has been stated before, the male tailors need health care support equally as compared to female tailors who need to have nutritional support and guidance as a priority.

Musculoskeletal Problems

This high occurrence of musculoskeletal complaints in this occupation is due to the fact that this work involves monotonous, highly repetitive tasks performed in a sitting working posture, with upper back curved and head bend over the sewing machine.

If not corrected at the right time, this health problem can seriously undermine the physical capacity of the tailoring staff to sustain the physical stress needed in the tailoring occupation and can adversely affect their earning power, thus setting a vicious cycle of no work, no money, malnutrition and weakness resulting in no work. Remedial action is needed urgently for this.

Musculoskeletal disorders have been reported from all sectors of society. They are common to both the workers in the organized industries such as the steel industries [7] (A. Daniel, et al) , construction workers [8] , coal miners [9] (Afacan) and in the unorganized industries [10] such as the beedi making industry, the glass industry and they have been reported even among sedentary workers.

A majority of these are either due to ergonomic stress or to work load [11].

The aetiology may differ in different situations, but the predominant cause of these disorders is invariably a wrong ergonomic posture during work. In unorganized industries, incorrect working posture often results in musculoskeletal disorders in more than $1/4^{th}$ of the employees.

Addictions

The high occurrence of addictions may be due to the fact that this work involves monotonous, highly repetitive tasks, performed in a sitting working posture and needing most concentration, as a mistake if committed, will be unfavourable from the business point of view and rectifying a mistake can either be not possible or may be time consuming. Besides, most tailors are illiterate with poor educational status,

as well as migration status and peer pressure too can contribute to this. As years pass, the likelihood of accepting some addictions will be high and hence, the trend of the rise in addictions with working years.

The difference is not statistically significant (P-value = 0.053)

Ophthalmic complaints

The reasons for the above ophthalmic complaints as revealed by the literature are [12]:

1. Long hours of work
2. Dimly light environment
3. Bend posture of head
4. Constant focus of accommodation
5. Tiny objects on which worker is focused
6. Lack of optical magnification

As stated in [Table/Fig 5] (B), this also could be because most females who are part-time tailors, work at their houses, which are slums with poor natural light even during the day time and hence, the incidence of more visual acuity problems.

Recommendations

Based on the results and the conclusions of the present study, the following recommendations were put forth:

1. Health education –There has always been a moral obligation to provide education in occupational health for the safety of the working population, since all the workers have a right to be adequately informed about the occupational risk that they have to face and to know what protective measures should be adopted. Health education is an essential component of total health care, because it aims to postpone the appearance of chronic illness.

2. Sustained effort should be continued with innovative approaches to sustain and to increase the inj.TT coverage in people who are engaged in the tailoring occupation in the Cheeta camp slums. This can be done by carrying out IEC activities in the community with the help of CHVs from the health post, as well as with the involvement of private medical practitioners and local NGOs.

3. There is a need to setup training centers which can impart formal instructions to tailors who are the inhabitants of these slums. Such training will introduce the scientific techniques in the trade and will make the workers more self assured.

4. Periodic checkups should be done for visual acuity and musculoskeletal complaints and the records should be adequately maintained.

5. Physiotherapy clinics should be opened at the Urban Health Centers at Cheeta camp, so that tailors having musculoskeletal problems can get proper physiotherapy care.

6. These workers should be covered under the ESIS scheme, so that they can avail of the majority of the benefits.

7. For traditional sewing work, a double foot rest with a pedal incorporated for use by either foot,should be designed. A forearm pad should be added to keep the wrist in the neutral position and the force required to depress the pedal should be reduced.

8. A proper sitting chair requires adjustable height, seat depth, lumbar support and an arm rest

9. In the working environment, an adjustable task light should added with a brightness of 1000 lx.

10. The noise level at the work place can exceed 90 db, so proper hearing protection and ear plugs should be used.

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